Data Analytics Capstone: Atlas Interactive Case Study

Introduction

In this case study, I will perform many real-world tasks of a junior data analyst at a fictional company, Atlas Interactive. In order to answer the key business questions, I will follow the steps of the data analysis process: Ask, Prepare, Process, Analyze, Share, and Act.

Quick links:

Data Source: kaggle_dataset [accessed on 11/11/25]
Data Visualizations: Tableau

Background

Atlas Interactive

Atlas Interactive is the publisher of **Shadow City Saga**, an immensely popular **Open-World Action-Adventure** game. The game boasts a massive player base and generates revenue through microtransactions and Downloadable Contents (DLCs). Atlas Interactive sets itself apart from other publishers by continuously releasing free content updates, new maps for exploration, and inclusive multiplayer modes, making the game appealing to a variety of gamers. The vast **majority of players are Casual** while a much smaller, highly engaged segment comprises the **Hardcore Players**.

Until now, Atlas Interactive's marketing strategy relied on raising brand awareness and appeal to the broad consumer segments. One strategy used was the flexibility of its access and purchase model: basic game purchase, premium battle passes (seasonal), and VIP-tier subscription memberships.

Customers who only made **basic game purchases and standard in-game purchases** are referred to as **Casual Players** while those who frequently purchase the **premium battle passes** and/or the recurring **VIP-tier subscription membership** are considered **Hardcore Players**.

Atlas Interactive's financial analysts have concluded that **Hardcore Players contribute more to the game's profits** than Casual Players due to their higher lifetime value (LTV) and consistent spending habits. Although the flexible purchase model helps attract more customers, **Moreno (the marketing director and my manager)** believes that maximising the number of **Hardcore Players** will be key to future profit growth and stability. Rather than creating a marketing campaign that targets all customers, Moreno believes that converting high-potential Casual Players into Hardcore Players is more desirable. This is because she observes that Casual Players are already invested in the **Shadow City Saga** world and have chosen the game for their entertainment needs.

Moreno has set a clear goal: **Design marketing and product strategies aimed at converting Casual Players into Hardcore Players.** However, the marketing analyst team needs to better understand how Hardcore and Casual Players differ, what motivates the former to invest more, and how digital channels (like in-game promotions, email, and social media) could affect their marketing tactics. Moreno and her team are interested in analyzing the **Shadow City Saga historical player behavior data** to identify conversion trends.

Scenario

I assume the role of **Junior Data Analyst** working in the marketing analyst team at Atlas Interactive. The marketing director believes the company's future success depends on maximising **Hardcore Players count**. Therefore, my team needs to understand how **Casual Players** and **Hardcore Players** engage with **Shadow City Saga** respectively. These insights would enable my team to design a new marketing strategy aimed at converting Casual Players into Hardcore Players. However, Atlas Interactive executives must approve our recommendations, hence the strategy must be backed up with compelling data insights and professional data visualisations.

Ask

Business Task

Devise marketing and product strategies to convert **Casual Players** into **Hardcore Players** to maximise the lifetime value of *Shadow City Saga*.

Analysis Questions

Three questions will guide the future conversion program:

1. How do **Hardcore Players** and **Casual Players** play **Shadow City Saga** differently?
2. What **behavioral** or **in-game reward factors** would motivate a **Casual Player** to transition into a **Hardcore Player**?

3. How can Atlas Interactive use **marketing channels** and **in-game promotions** to convince **Casual Players** to become **Hardcore Players**?

Prepare

Data Source

I will use Atlas Interactive's historical gaming data to analyse and identify trends which can be downloaded from kaggle_dataset. The data has been made available by Creative Commons under this license.
This is public data that can be used to explore how different **types of players** play **Shadow City Saga**. But note that data-privacy issues prohibit from using players' personally identifiable information. This means that we won't be able to connect in-game purchases to credit card numbers to determine if casual players have purchased multiple **premium battle passes** and/or the recurring **VIP-tier subscription membership.**

Data Organization

There is one spreadsheet that contains data such as player id, demographics, game type, engagement time, quantity of purchase, gameplay level and progression. The corresponding column names are: PlayerID, Age, Gender, Location, GameGenre, PlayTimeHours, InGamePurchases, GameDifficulty, SessionsPerWeek, AvgSessionDurationMinutes, PlayerLevel, AchievementsUnlocked, EngagementLevel.

Process

Spreadsheet is used to work on the dataset and clean it.
Reason:
A spreadsheet can handle up to 10,000,000 cells in Google Sheets. Since Atlas Interactive's dataset has 520,429 cells (40,033 rows x 13 columns), a spreadsheet is sufficient in handling this volume of data.

Data Exploration & Cleaning

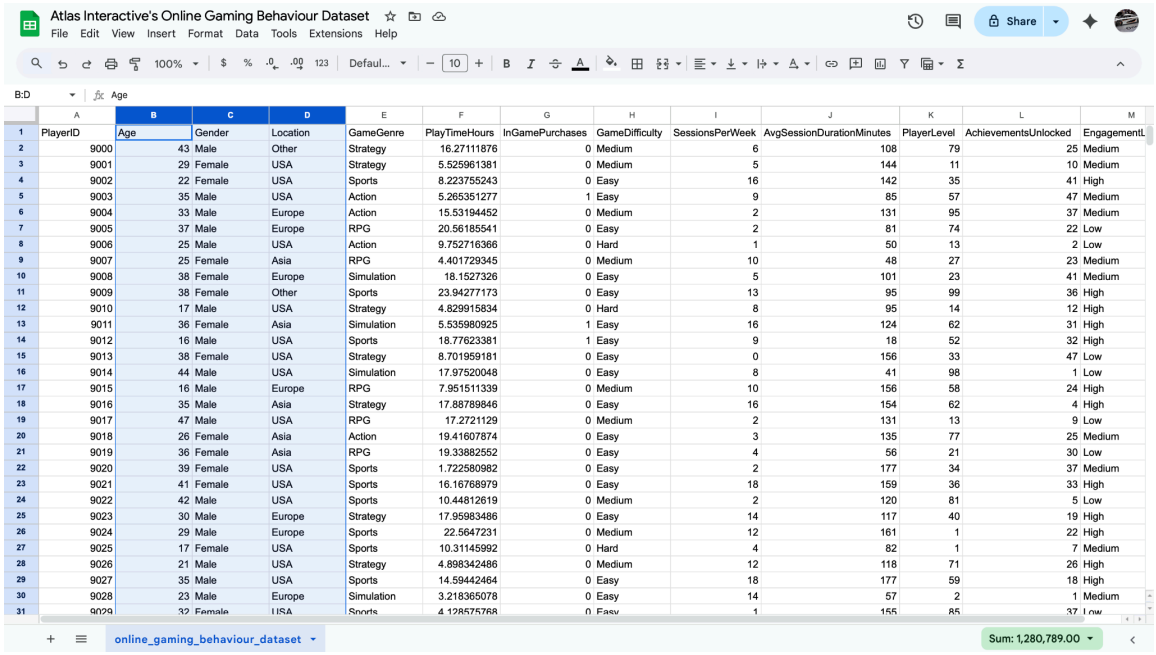
Before cleaning the data, I familarise myself with the data to understand its meaning. Thereafter, I will remove and modify irrelevant data to suit this project's needs.

Observations and actions:

1. The table below shows all column headers.

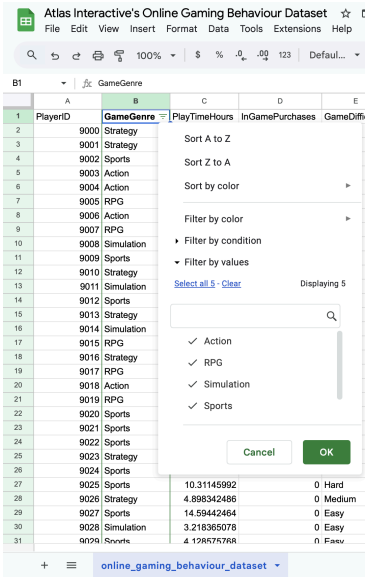
PlayerID	Age	Gender	Location	GameGenre	PlayTime Hours	InGame Purchases	GameDifficulty	SessionsPerWeek	AvgSession DurationMinutes	PlayerLevel	Achievements Unlocked	Engagement Level

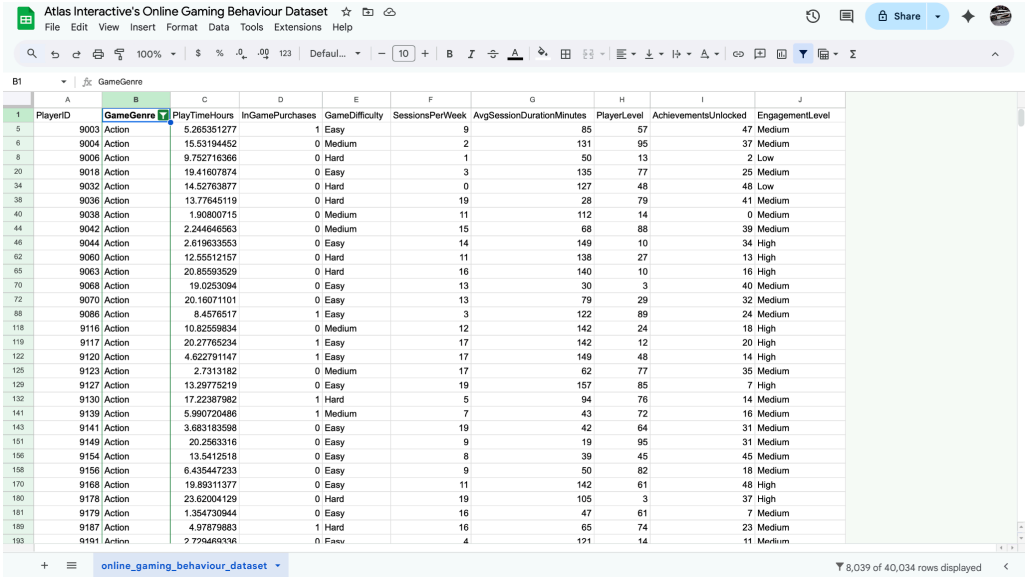
2. Data preparation **streamlined the dataset** by removing non-essential fields. Since the core business objective is to identify factors influencing the **conversion of Casual to Hardcore Players**, the demographics data [ie. **Age (Column B), Gender (Column C), and Location data (Columns D)**] are **excluded** from the final dataset. This **allows the concentration of analytical effort** exclusively on the behavioral metrics that directly measure player engagement and commitment.



PlayerID	Age	Gender	Location	GameGenre	PlayTimeHours	InGamePurchases	GameDifficulty	SessionsPerWeek	AvgSessionDurationMinutes	PlayerLevel	AchievementsUnlocked	EngagementL
9000	43	Male	Other	Strategy	16.27111876	0	Medium	6	108	79	25	Medium
9001	29	Female	USA	Strategy	5.525961381	0	Medium	5	144	11	10	Medium
9002	22	Female	USA	Sports	8.223755243	0	Easy	16	142	35	41	High
9003	35	Male	USA	Action	5.265351277	1	Easy	9	85	57	47	Medium
9004	33	Male	Europe	Action	15.53194452	0	Medium	2	131	95	37	Medium
9005	37	Male	Europe	RPG	20.56185541	0	Easy	2	81	74	22	Low
9006	25	Male	USA	Action	9.752716366	0	Hard	1	50	13	2	Low
9007	25	Female	Asia	RPG	4.401729345	0	Medium	10	48	27	23	Medium
9008	38	Female	Europe	Simulation	18.1527326	0	Easy	5	101	23	41	Medium
9009	38	Female	Other	Sports	23.94277173	0	Easy	13	95	99	36	High
9010	17	Male	USA	Strategy	4.829915834	0	Hard	8	95	14	12	High
9011	36	Female	Asia	Simulation	5.535980925	1	Easy	16	124	62	31	High
9012	16	Male	USA	Sports	18.77623381	1	Easy	9	18	52	32	High
9013	38	Female	USA	Strategy	8.701959181	0	Easy	0	156	33	47	Low
9014	44	Male	USA	Simulation	17.97520048	0	Easy	8	41	98	1	Low
9015	16	Male	Europe	RPG	7.951511339	0	Medium	10	156	58	24	High
9016	35	Male	Asia	Strategy	17.88789846	0	Easy	16	154	62	4	High
9017	47	Male	USA	RPG	17.2721129	0	Medium	2	131	13	9	Low
9018	26	Female	Asia	Action	19.41607874	0	Easy	3	135	77	25	Medium
9019	36	Female	Asia	RPG	19.33882552	0	Easy	4	56	21	30	Low
9020	39	Female	USA	Sports	1.722580982	0	Easy	2	177	34	37	Medium
9021	41	Female	USA	Sports	16.16768979	0	Easy	18	159	36	33	High
9022	42	Male	USA	Sports	10.44812619	0	Medium	2	120	81	5	Low
9023	30	Male	Europe	Strategy	17.95983486	0	Easy	14	117	40	19	High
9024	29	Male	Europe	Sports	22.5647231	0	Medium	12	161	1	22	High
9025	17	Female	USA	Sports	10.31145992	0	Hard	4	82	1	7	Medium
9026	21	Male	USA	Strategy	4.898342486	0	Medium	12	118	71	26	High
9027	35	Male	USA	Sports	14.59442464	0	Easy	18	177	59	18	High
9028	23	Male	Europe	Simulation	3.218365078	0	Easy	14	57	2	1	Medium
9029	32	Female	USA	Sports	4.128575768	0	Easy	1	155	85	37	Low

3. Data filtering was performed to maximise **analytical precision** relative to the project scope. Since the project focuses only on *Shadow City Saga*, an **Open-World Action-Adventure** game, the dataset was **filtered** to **exclude** all rows of data where **GameGenre (Column B)** does not contain the word “Action” (ie. RPG, Simulation, Sports, Strategy). This **refined the focus** to player behavior specifically within the relevant "Action" category.





PlayerID	GameGenre	PlayTimeHours	InGamePurchases	GameDifficulty	SessionsPerWeek	AvgSessionDurationMinutes	PlayerLevel	AchievementsUnlocked	EngagementLevel
9003	Action	5.265351277	1	Easy	9	85	57	47	Medium
9004	Action	15.53194452	0	Medium	2	131	95	37	Medium
9006	Action	9.752716366	0	Hard	1	50	13	2	Low
9018	Action	19.41607874	0	Easy	3	135	77	25	Medium
9032	Action	14.52763877	0	Hard	0	127	48	48	Low
9036	Action	13.77645119	0	Hard	19	28	79	41	Medium
9038	Action	1.90800715	0	Medium	11	112	14	0	Medium
9042	Action	2.244646563	0	Medium	15	68	88	39	Medium
9044	Action	2.619633553	0	Easy	14	149	10	34	High
9060	Action	12.55512157	0	Hard	11	138	27	13	High
9063	Action	20.85593529	0	Hard	16	140	10	16	High
9068	Action	19.0253094	0	Easy	13	30	3	40	Medium
9070	Action	20.16071101	0	Easy	13	79	29	32	Medium
9086	Action	8.4576517	1	Easy	3	122	89	24	Medium
9116	Action	10.82559834	0	Medium	12	142	24	18	High
9117	Action	20.27765234	1	Easy	17	142	12	20	High
9120	Action	4.622791147	1	Easy	17	149	48	14	High
9123	Action	2.7313182	0	Medium	17	62	77	35	Medium
9127	Action	13.29775219	0	Easy	19	157	85	7	High
9130	Action	17.22387982	1	Hard	5	94	76	14	Medium
9139	Action	5.990720486	1	Medium	7	43	72	16	Medium
9141	Action	3.683183598	0	Easy	19	42	64	31	Medium
9149	Action	20.2563316	0	Easy	9	19	95	31	Medium
9154	Action	13.5412518	0	Easy	8	39	45	45	Medium
9156	Action	6.435447233	0	Easy	9	50	82	18	Medium
9168	Action	19.89311377	0	Easy	11	142	61	48	High
9178	Action	23.62004129	0	Hard	19	105	3	37	High
9179	Action	1.354730944	0	Easy	16	47	61	7	Medium
9187	Action	4.97879883	1	Hard	16	65	74	23	Medium
9191	Action	2.729469336	0	Easy	4	121	14	11	Medium

Summary

1. All irrelevant columns of demographic data (ie. **Age, Gender, and Location data)** are deleted.
2. Rows of data where the GameGenre Column does not indicate that the game played by the users is "**Action**" are excluded.
3. A total of 31,993 rows and 3 columns of irrelevant data are removed in this step.

Analyze and Share

Data Visualization: Tableau
The data is cleaned and stored appropriately and is now prepared for analysis. I visualised the analysed results in Tableau.
The first analysis question is: How do **Hardcore Players** and **Casual Players** play **Shadow City Saga** differently? (Diagnosis)
This question focuses on **descriptive analysis** and **comparison** of key behavioral metrics across the defined segments (Casual vs Hardcore) and the intermediate segments of **Low, Medium, and High Engagement**.

1. Analysis of `TotalPlayTimeHours` (Total Time Investment since starting the game)

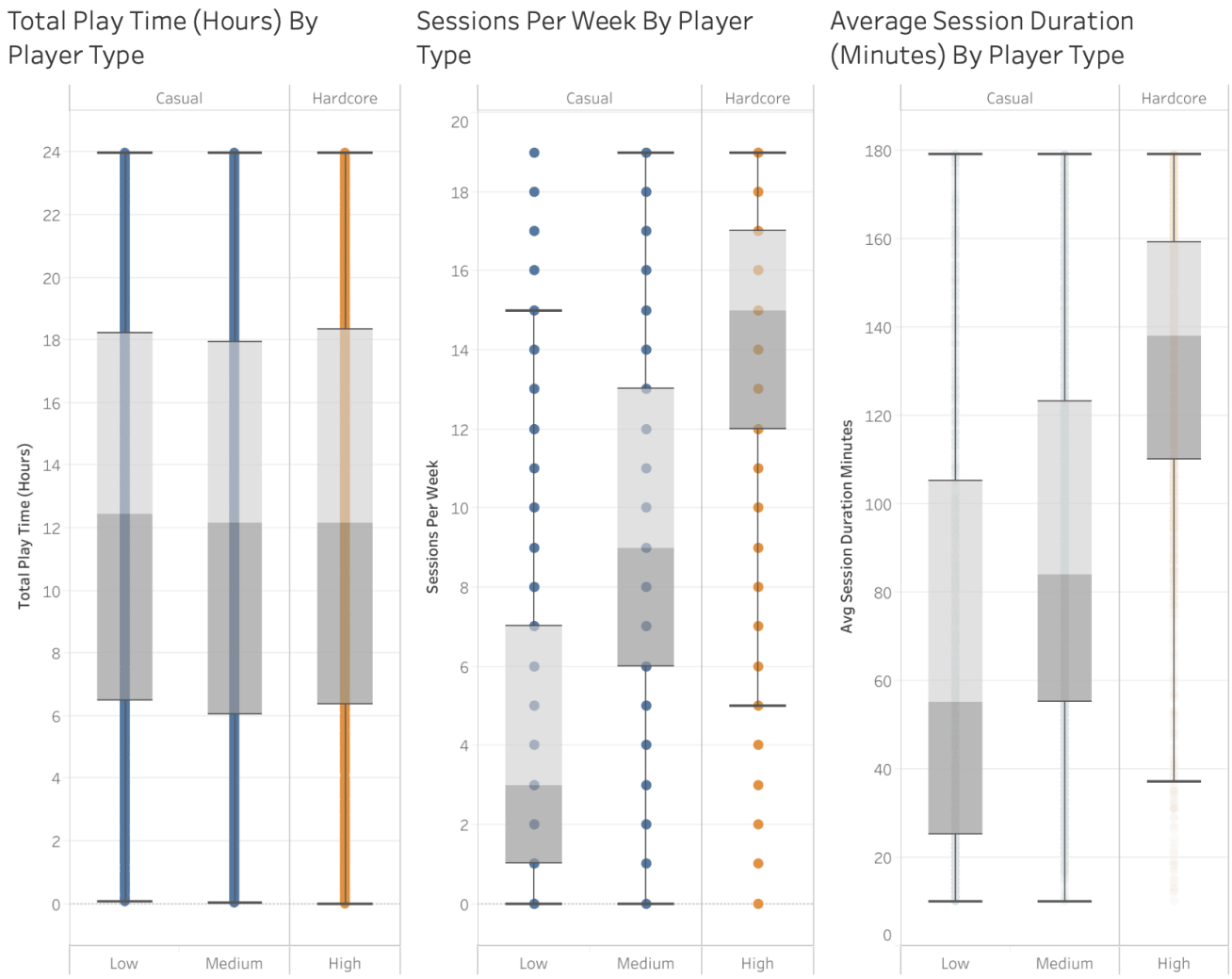
The **goal** of this visualisation is to compare the distribution of **cumulative playtime hours** for the Low, Medium, and High player segments. I used a **Side-by-Side Box Plot (Three Segments)** to confirm the **lack of distinction** in **total cumulative hours invested since the players downloaded the game** across the engagement levels, proving that total hours is limited in usefulness as a metric for conversion.

2. Analysis of `SessionsPerWeek` (Habit and Frequency)

The **goal** of this visualisation is to identify the **conversion threshold for gaming habit-building** by comparing the **frequency of sessions logged-in per week** across the Low, Medium, and High engagement segments. I used a **Side-by-Side Box Plot (Three Segments)** because it clearly quantifies the **Medium → High conversion gap** in frequency, allowing us to isolate the precise gaming habit increase required to move a player into the Hardcore segment.

3. Analysis of `AvgSessionDurationMinutes` (Immersion and Intensity)

The **goal** of this visualisation is to define the **required level of immersion and intensity** by comparing the **average duration of each gaming session (minutes)** across the Low, Medium, and High engagement segments. I used a **Side-by-Side Box Plot (Three Segments)** because it clearly maps the progressive increase in session commitment, identifying the **crucial time threshold necessary** for players to fully engage with and value recurring premium content.



1. Average Play Time Hours (`PlayTimeHours`)

Interpretation	The median average playtime hours is consistent across all three segments: Low (12.46 hrs), Medium (12.17hrs), and High (12.16 hrs). The distributions (quartiles and ranges) are nearly identical, confirming that overall time investment is standardised across the player base.
Key Insight	**Total time investment is not a useful predictor of engagement level or profitability.** The fact that the most profitable segment (ie. Hardcore/ High Engagement Players) logged similar total hours to the least engaged (ie. Casual/ Low Engagement Players) proves that conversion is driven by gaming **habit (frequency)** and **intensity (duration)**, not raw time volume.
Implications for Strategy	**Action:** The marketing and product teams should **eliminate** any strategy that rewards or promotes increasing aggregate playtime. Resources must be focused entirely on influencing the **frequency** and **duration** of individual sessions to achieve high conversion rates.

2. Sessions Per Week (`SessionsPerWeek`)

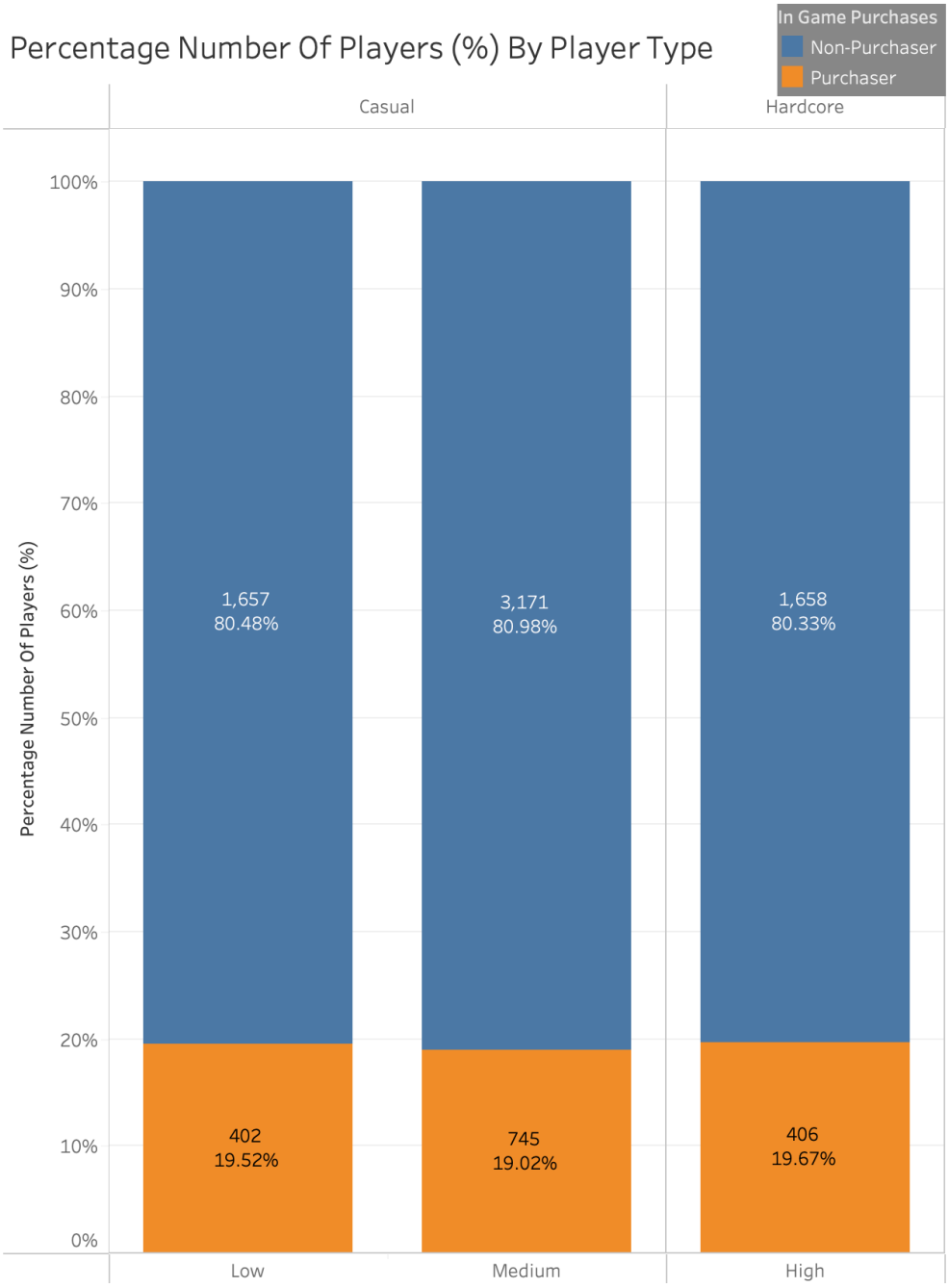
Interpretation	Session frequency shows a clear, progressive, and defining data: Low Engagement players median average **3 sessions/week**, Medium median average **9 sessions/week**, and High Engagement median average **15 sessions/week**. The hardest behavioral shift is the **Low** → **Medium** jump (a ×3 increment), while the **Medium** → **High** jump is a smaller, more manageable increase of **6 sessions**.
Key Insight	**Gaming habit is the primary, most actionable driver of conversion.** The Medium segment (the high-potential target) has already overcome the massive hurdle of infrequent play. The 9→15 sessions/week difference is the key **conversion gap that** must be closed to maximise Hardcore Player count.
Implications for Strategy	**Action:** Design **short, daily challenges and incentives** specifically for the Medium Engagement segment (median of 9 sessions) to push them past **12 sessions per week** (the High-Engagement's lower quartile). This targeted effort on the smaller, more achievable gap enables efficient use of financial resources.

3. Average Session Duration Minutes (`AvgSessionDurationMinutes`)

Interpretation	Session intensity also progresses significantly: Low Engagement median duration is **55 minutes**, Medium is **84 minutes**, and High is **138 minutes**. The necessary jump from **Medium to High** requires a substantial increase of **54 minutes** per session, in comparison to the jump from **Low to Medium**'s **29 minutes**, signifying a major increase in commitment.
Key Insight	**Deeper immersion is the requirement for players' financial commitment.** The High Engagement player commits to sessions long enough to fully utilise premium, recurring game features (eg. 138 minutes is enough time to complete a full battle pass track). The Medium segment, while showing commitment (84 minutes), needs a major push in immersion of the game's content to convert.
Implications for Strategy	**Action:** Implement a two-tiered in-game promotion system. Target the **Medium Engagement median (84 minutes)** with a high-value pop-up or challenge that explicitly requires the **VIP subscription** or **Premium Battle Pass** to unlock a major bonus, strategically extending their play into the 138-minute High-Engagement zone.

4. Defining Purchase Behavior Across Engagement Segments

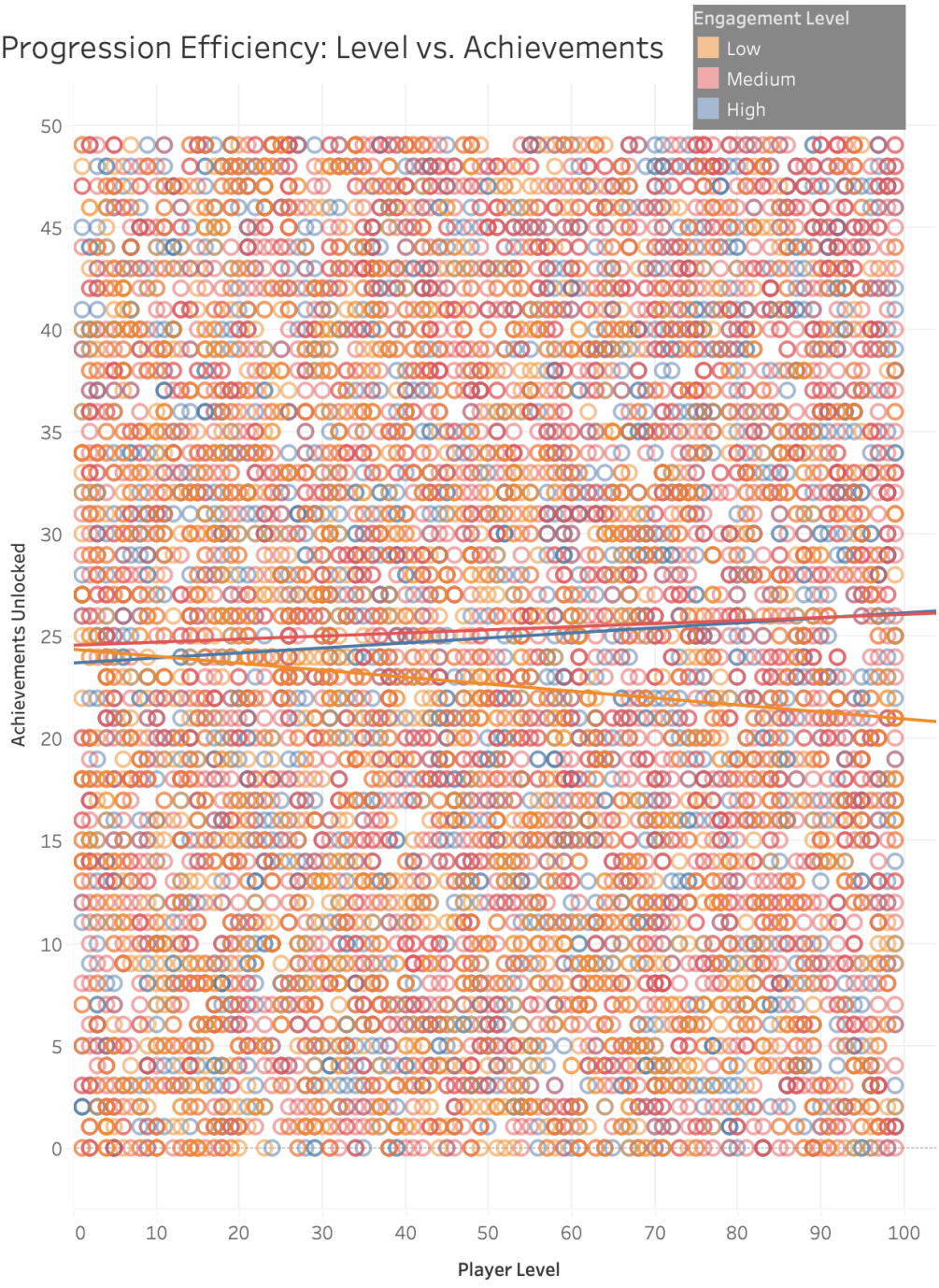
The **goal** of this visualisation is to test the company's hypothesis that Hardcore Players are primarily differentiated by **making any in-game purchase**, through comparison of the **proportion of players who have purchased** across the Low, Medium, and High engagement segments. I used a **100% Stacked Bar Chart (Three Segments)** because this visual allows for a direct comparison of the **purchaser vs. non-purchaser ratio** within each segment, providing clear evidence on whether a single initial purchase is a predictor of high engagement.



Interpretation	A comparison of the in-game purchase rates reveals **no significant difference** across the engagement segments. The rate of players who have made at least one purchase is nearly identical: **19.52% for Low, 19.02% for Medium, and 19.67% for High Engagement players**. This means over 80% of all players, regardless of engagement level, have never made a purchase.
Key Insight	The act of making a **single, general in-game purchase is not a distinguishing factor** for highly profitable (Hardcore) players. Their higher Lifetime Value (LTV) must be driven by **recurring premium spending** (eg. VIP subscriptions, Battle Passes) or **significantly higher value** in subsequent purchases, all concentrated within that small ≈19% purchasing segment.
Implications for Strategy	**Action:** Atlas Interactive should **abandon** any broad marketing strategies aimed at converting the ≈80% of non-purchasing Casual/ Low and Medium Engagement Players. Instead, the focus must be on an extremely targeted **"upsell" strategy** on the **Medium Engagement players (≈19% of that group)** who have **already made a purchase**.

5. Progression Efficiency and Feature Utilization Analysis

The **goal** of this visualisation is to define the **progression and feature utilisation efficiency** by comparing the relationship between **Player Level** and quantity of **Achievements Unlocked** respectively across the Low, Medium, and High engagement segments. I used a **Scatter Plot with Segmented Trend Lines** because this visual effectively shows whether High Engagement players achieve a **steeper progression curve** (more achievements per level) than the other segments, thus demonstrating greater commitment to the in-game features.



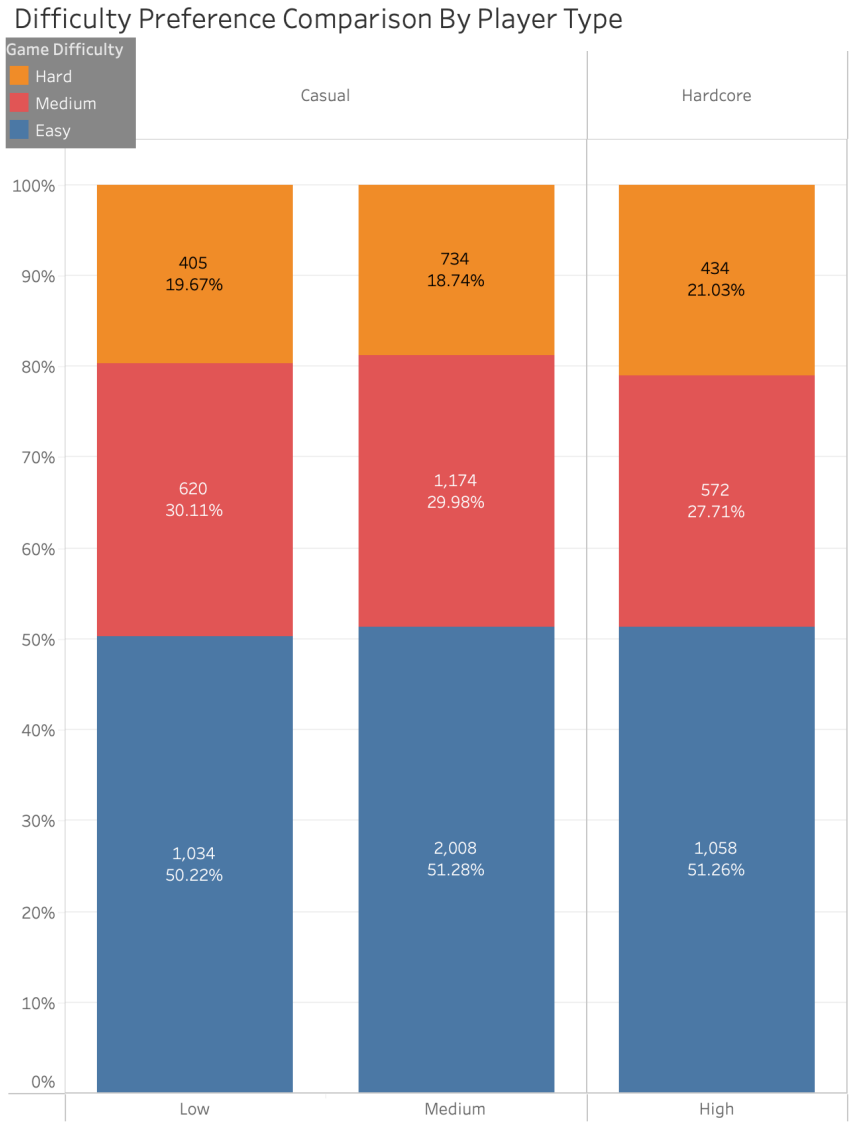
Interpretation	The trend lines show an **extremely weak correlation** between Player Level and Achievements Unlocked for all three segments (Low: $R2 \approx 0.0025$, Medium: $R2 \approx 0.0009$, High: $R2 \approx 0.0024$). The data is highly scattered, with no discernible relationship. Furthermore, the Low Engagement group shows a technically nonsensical, slightly negative slope ($\nabla = -0.0340$), confirming the model is invalid for all segments.
Key Insight	**Progression efficiency (Achievements unlocked per Level) is not a distinguishing behavioral factor for** conversion. The lack of any meaningful correlation suggests that the in-game achievement system is either too broad, easy, or ignored by players, rendering it **ineffective as a metric** for analysis of feature utilisation or deeper engagement.
Implications for Strategy	**Action:** The product team should **immediately re-evaluate the design and rewards tied to achievements**. Since achievements fail to correlate with engagement, they are not driving deeper feature utilisation. Hence, **marketing strategies must rely on the proven differentiators:** the significant gaps in **Session Frequency** and **Session Duration** found in the previous analyses.

The next analysis question is: What **behavioral** or **in-game reward factors** would motivate a **Casual Player** to transition into a **Hardcore Player**? (Incentives)

This involves identifying the *leading indicators* of conversion, focusing on the players in the **Medium Engagement group** as the prime conversion target.

6. Difficulty Preference as an In-Game Motivational Factor

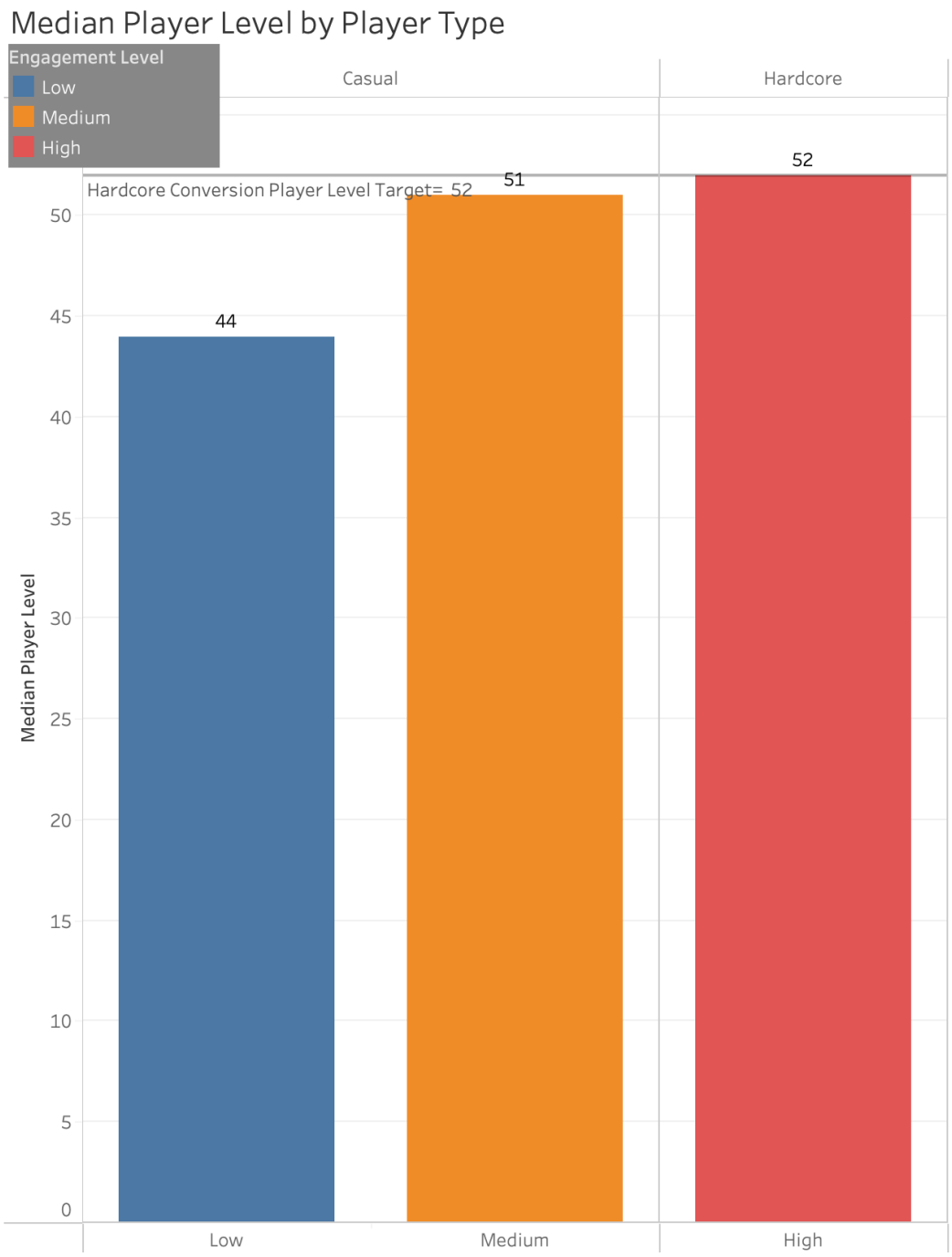
The **goal** of this visualisation is to identify a clear **in-game motivational factor** by comparing the **distribution of preferred Gameplay Difficulty** chosen by players across the Low, Medium, and High engagement segments. I used a **100% Stacked Bar Chart (Three Segments)** because it clearly reveals if High Engagement players disproportionately favor a specific difficulty setting. This allows Atlas Interactive to structure conversion rewards (such as exclusive items) around encouraging Medium players to attempt that motivational difficulty level.



Interpretation	**Easy difficulty** is the overwhelmingly dominant preference across all engagement levels (≈50%). However, the proportion of players choosing **Hard difficulty** peaks within the **High Engagement** group (21.03%). Notably, the strategic target **Medium Engagement** group shows the *lowest* proportional preference for Hard difficulty (18.74%).
Key Insight	**Tolerance for Hard difficulty is a behavioral indicator of a Hardcore mindset.** The slight increase in Hard mode preference for High Engagement players suggests they are motivated by challenges or the unique rewards tied to it. The strategic hurdle is that the Medium Engagement conversion pool is the **least motivated** by this factor, indicating a reluctance to fully immerse in challenging content.
Implications for Strategy	**Action:** Design **in-game promotions and time-limited events** specifically to reward Medium Engagement players for attempting and completing Hard mode content. This needs to include high-value, exclusive rewards (eg. premium content unlocks) that are tied only to challenging tasks, thereby associating **high difficulty gameplay** with **Hardcore yet premium experience**.

7. Progression Gap Target: Median Player Level

The **goal** of this visualisation is to establish a concrete, actionable **progression threshold** by comparing the **Median Player Level** across the Low, Medium, and High engagement segments. I used a **Grouped Bar Chart Comparing Medians with a Reference Line** because this format clearly isolates the **level gap** between the Medium Engagement segment and the Hardcore Median Target, allowing the product team to define a specific level goal for conversion rewards.



Interpretation

The Median Player Level shows a clear progression: Low (44), Medium (51), and High (52). The majority of the progression effort occurs in earlier stages (a 7-level jump from Low to Medium). The critical **conversion gap** between the Medium and Hardcore segment is **extremely small**, requiring only a **1-level increase** (Level 51 to Level 52).

Key Insight

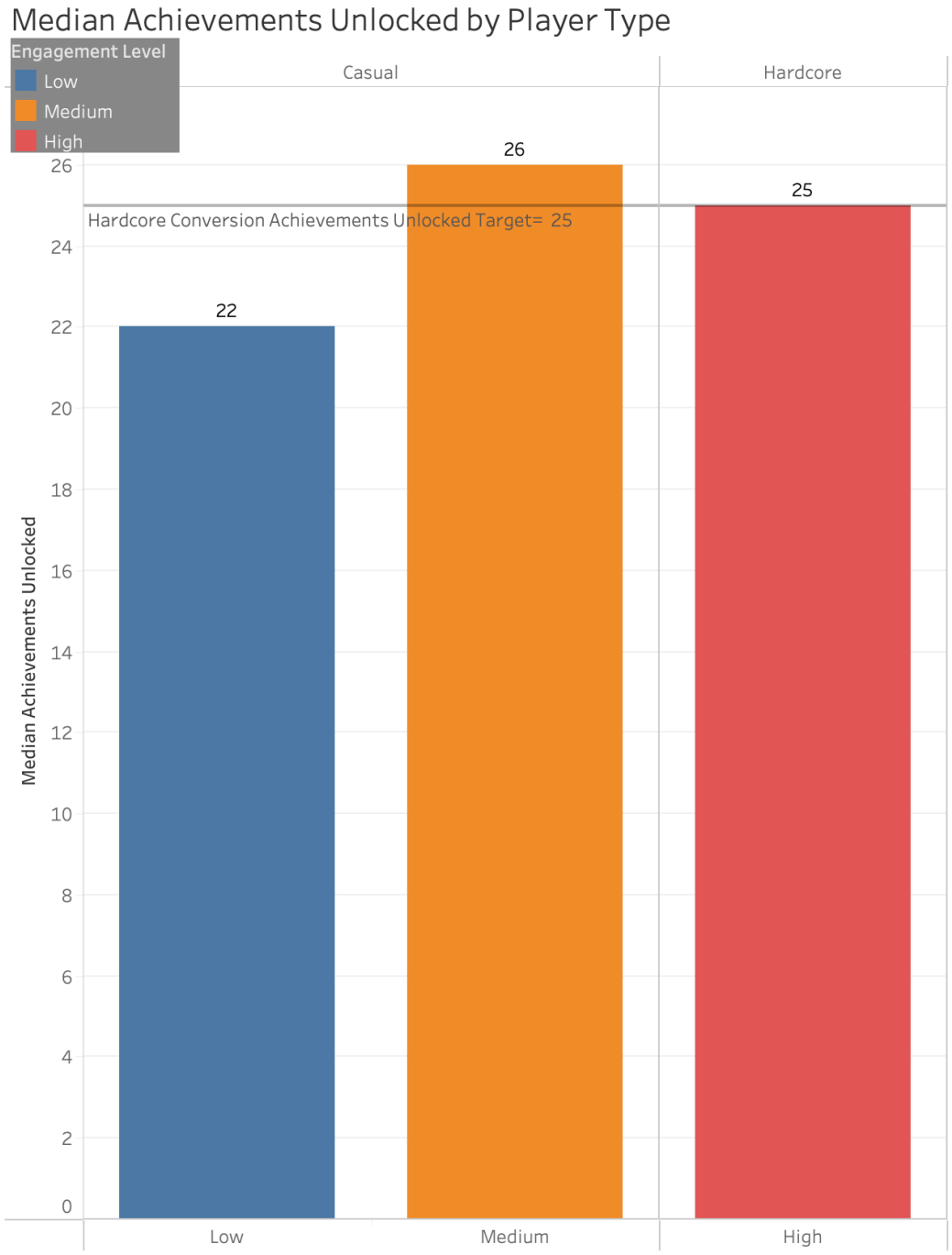
Player Level is the last behavioral bottleneck for conversion. The Medium player is already *at* the level required to be Hardcore. This means that transiting from Level 51 to 52 is the **critical gateway where** players either commit to the necessary high-frequency and long-duration gaming habits (identified in Visualisation #2 and #3) or stagnate.

Implications for Strategy

Action: The product team must set the conversion goal at **Level 52** and trigger the highest-value, recurring revenue promotions (eg. VIP Pass, Premium Subscription) **immediately after players reach Level 51**. This creates a hyper-targeted, last-chance incentive to commit financially and behaviorally before the player hits the post-level-51 stagnation point.

8. Achievement Gap Target: Reward-Based Motivation

The **goal** of this visualisation is to establish a clear **in-game reward threshold** by comparing the **Median Achievements Unlocked** across the Low, Medium, and High engagement segments. I used a **Grouped Bar Chart Comparing Medians with a Reference Line** because this format precisely quantifies the achievement gap between the Medium segment and the Hardcore Median Target, which allows the product team to define a concrete reward goal for motivational campaigns.



Interpretation

The Median Achievements Unlocked is inconsistent with the engagement progression. Although the Low segment median is 22, the **Medium Engagement segment records the highest median achievement count (26)**, unexpectedly outperforming the Hardcore segment (25).

Key Insight

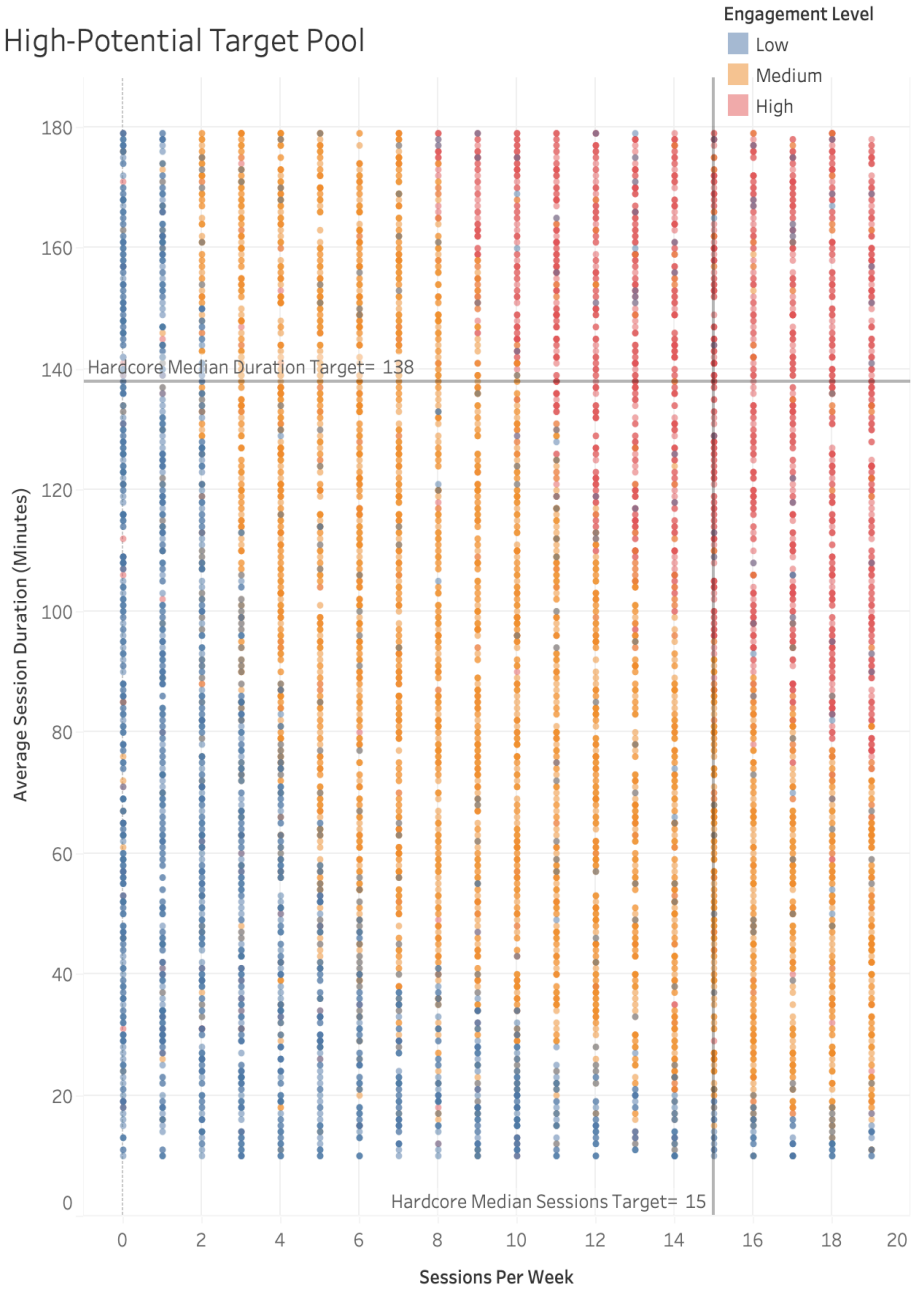
Achievements do not act as a successful motivational or retention factor. Since Medium players are already out-achieving Hardcore players, there is no achievement gap to close. This strongly confirms the conclusion from the Progression Scatter Plot analysis (Visualisation #5) that unlocking achievements do not reliably drive the long-term gaming habit or financial value associated with the Hardcore segment.

Implications for Strategy

Action: Immediately **remove the achievement count** from any proposed conversion strategy, rewards campaign, or feature-use promotion. The product team needs to investigate if **achievements are too easy to obtain** and fail to drive **sustained player retention**. All motivational efforts must be focused on the proven drivers: **Session Frequency** (Visualisation #2) and **Session Duration** (Visualisation #3).

9. High-Potential Target Pool Synthesis: The Conversion Quadrant

The **goal** of this synthesis visualisation is to precisely identify the **High-Potential Target Pool** by mapping the Medium Engagement segment against the two most crucial behavioral thresholds: **Session Frequency** and **Session Duration**. We used a **Scatter Plot with Two Median Reference Lines** because the resulting intersection defines the **Hardcore Conversion Quadrant (top-right corner of visualisation)**, visually isolating the Medium Engagement players who are already adopting Hardcore gaming habits and are therefore the most efficient target for conversion campaigns.



Segment Threshold Compliance

	Player_Type / Engagement Level		
	Casual		Hardcore
Target_Quadrant_Flag	Low	Medium	High
Below Threshold	2,041 99.13%	3,896 99.49%	1,623 78.63%
Hardcore Threshold Met	18 0.87%	20 0.51%	441 21.37%

Interpretation

The **High-Potential Target Pool** (Medium Engagement players who meet both Hardcore median thresholds) is extremely small, comprising only **0.51%** of the entire Medium Engagement segment. In comparison, **21.37%** of the High Engagement segment meet this threshold. Interestingly, the Low Engagement segment shows a slightly higher rate of meeting the threshold (0.87%) than the Medium Engagement Segment.

Key Insight

Financial efficiency can be maximised due to the size of the target (20). Since less than one percent of the Medium segment is already behaving like a Hardcore player, broad conversion campaigns are inefficient and financially wasteful. The conversion strategy must be laser-focused on that **0.51%** cohort, using digital channels to reach them directly and immediately monetise their established high-value behavior.

Implications for Strategy

Action: Immediately use behavioral segmentation tools (such as **SQL queries** on the player database or **analytics platform filters**) to flag the **0.51%** of Medium players who fall into the Conversion Quadrant. The marketing team should execute a **high-priority digital campaign** (eg. Email, Social retargeting) offering a personalised, high-value incentive (eg. 50% off the first month of VIP Subscription) to convert them instantly, as they represent the target with the highest Return on Investment (ROI) in the entire player base.

The final analysis question is: How can Atlas Interactive use **marketing channels** and **in-game promotions** to convince **Casual Players** to become **Hardcore Players**? (Strategy)

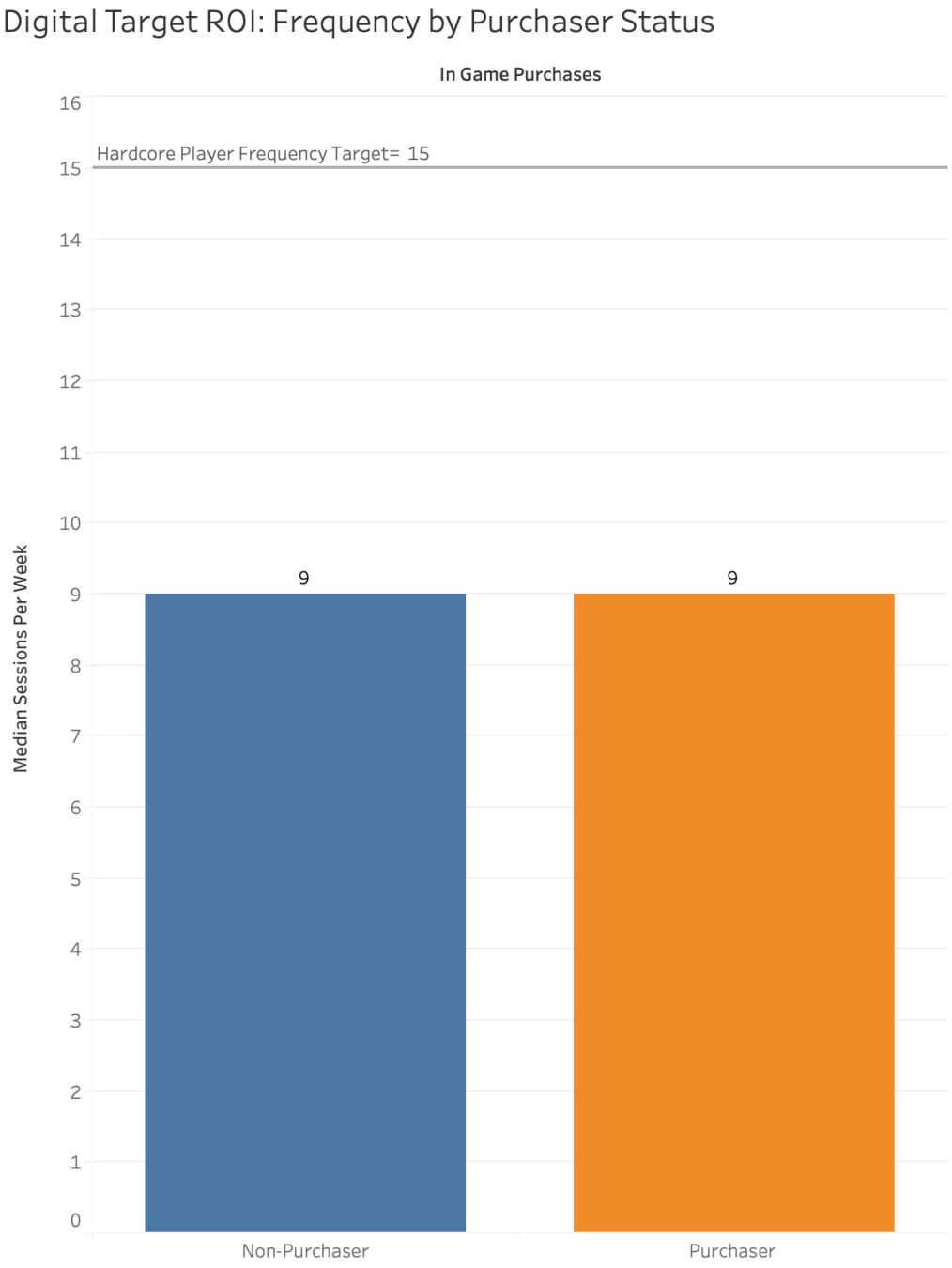
This involves **synthesising the actionable insights** from the previous analysis questions to create **channel-specific, high-ROI marketing and product recommendations** targeting the High-Potential subset of the Medium Engagement group.

Based on the comprehensive behavioral analysis conducted in previous analysis questions, the primary strategic focus for conversion is exclusively the **Medium Engagement** player segment. This decision is driven by maximised **Return on Investment (ROI)** and conversion feasibility:

1. **Feasibility and Proximity to Target:** The Median Medium player is significantly closer to the Hardcore behavioral thresholds (eg. Player Level 51 vs. the Hardcore Level 52, and much higher Session Frequency and Duration than Low players). They have already demonstrated the baseline commitment necessary to form lasting gaming habits.
2. **Optimised ROI:** Marketing strategy should not target the Low Engagement segment because it exhibits the highest churn risk and requires the greatest promotional effort to change behavior, therefore yielding a low ROI. By focusing on the Medium segment, Atlas Interactive targets the cohort most likely to convert with the smallest promotional nudge.
3. **Efficiency of Effort:** Concentrating marketing and product resources solely on the Medium segment ensures that campaigns are not diluted across a disengaged population, leading to a higher conversion rate per dollar spent.

10. Digital Channel Strategy: Financial Conversion Target

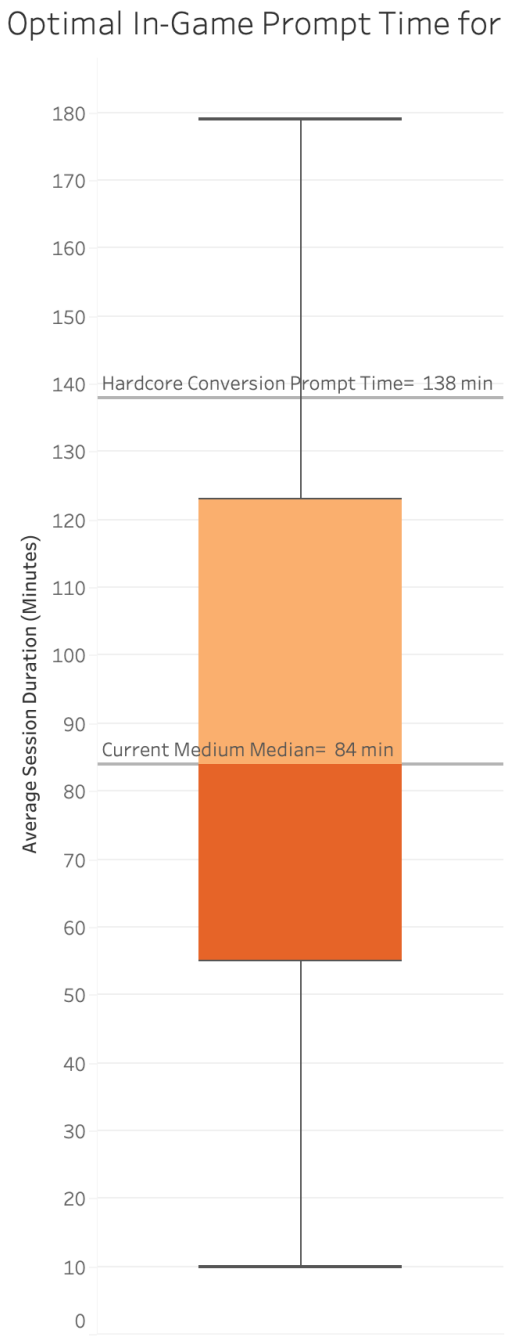
The **goal** of this visualisation is to define the **digital marketing target with the highest Return on Investment (ROI)** by comparing the median **Sessions Per Week** of Medium Purchasers against Non-Purchasers, using the Hardcore Player threshold (median of 15 sessions) as the benchmark. I used a **Grouped Bar Chart Comparing Medians with a Reference Line** to conclusively test the assumption that past purchase history is a reliable predictor of the frequency needed for Hardcore conversion.



Interpretation	The median **Sessions Per Week** is **identical** for both Purchasers and Non-Purchasers in the Medium Engagement segment, at **9 sessions** per week. Both groups sit significantly below the Hardcore Frequency Target of **15 sessions** per week, highlighting a substantial 6-session weekly gap to conversion.
Key Insight	**Purchaser status is not a predictor of future high engagement.** Since Medium Engagement players who have already purchased in-game items share the exact same low gaming habit level (9 sessions/week) as those who have not purchased, digital marketing strategies based on a player's **past purchase history are inefficient** and should be avoided for the Medium Engagement segment.
Implications for Strategy	**Action:** Digital marketing efforts aimed at player conversion must **abandon segmentation by purchase history** for the Medium Engagement segment. Instead, Atlas Interactive should use digital channels (such as email, push notifications) to deliver **frequency-driven rewards** (eg. "Hit 12 Sessions this week, get a bonus item") to *all* Medium Engagement players, focusing purely on increasing the frequency baseline from 9 towards the Hardcore target of 15.

11. Optimal In-Game Prompt Time: Product Specification

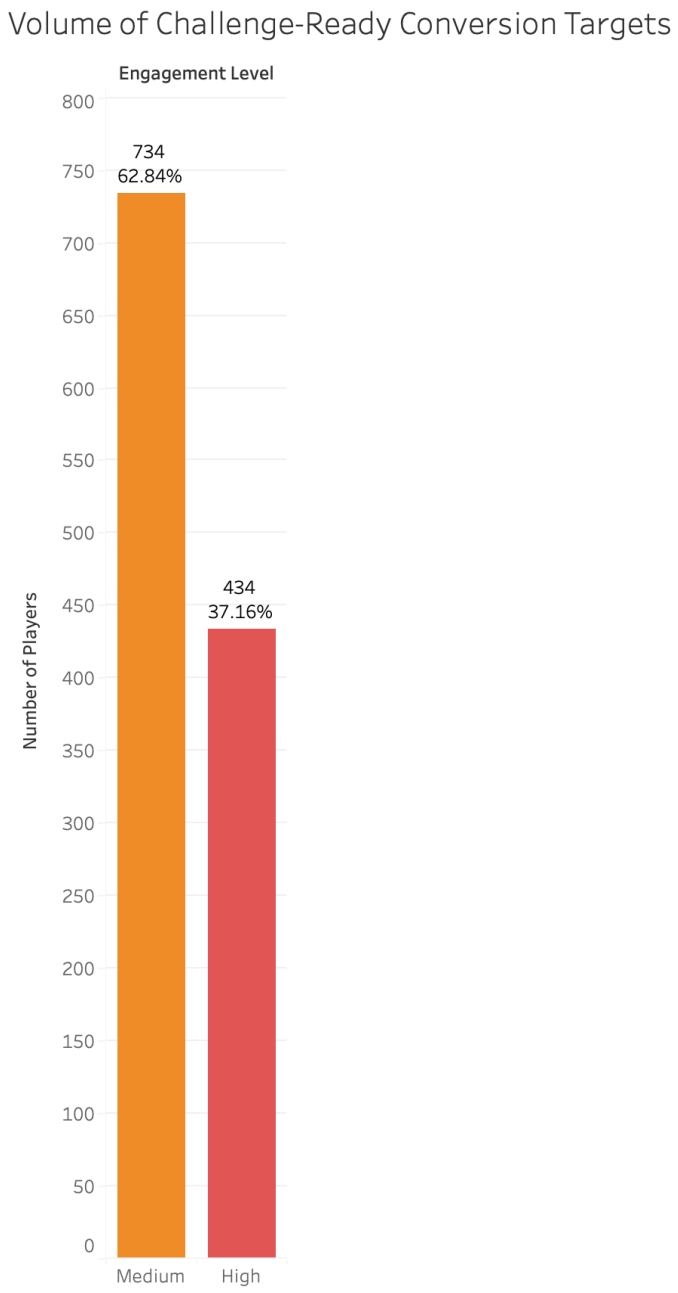
The **goal** of this visualisation is to translate the Hardcore behavioral intensity finding into a precise **product specification** by analysing the session duration distribution of the Medium Engagement segment. I used a **Box Plot with Dual Median Reference Lines** because this format clearly shows the current statistical variance and establishes the **Hardcore Conversion Prompt Time (138 minutes)**, which is the exact minute mark the product team should utilise to trigger the highest-value, conversion-focused in-game promotion.



Interpretation	The **current median average session duration** for the Medium Engagement segment is **84 minutes**. The vast majority of the segment (75%) concludes their session by the **Upper Quartile (123 minutes)**. The Hardcore Conversion Prompt Time is **138 minutes**, which sits beyond the Upper Quartile, highlighting a large **15-minute intensity gap** (138−123) that players must cross to reach the Hardcore behavior threshold.
Key Insight	**The critical decision point occurs between the 123 and 138-minute marks.** Since the Hardcore target (138 min) is *above* the Upper Quartile (123 min), a high-value promotion must be triggered at a time that incentivises the top 25% of Medium players to sustain their session past their natural churn time.
Implications for Strategy	**Action:** The product team must programme the highest-value, recurring purchase promotion (eg. VIP Pass) to trigger precisely at the **138-minute mark**. Additionally, a light, preparatory incentive can be delivered at the **123-minute mark (Upper Quartile)** to stabilise the session and encourage the player to push beyond their natural duration ceiling toward the 138-minute conversion goal.

12. Targeted Difficulty Incentive: Quantifying Challenge-Ready Players

The **goal** of this visualisation is to find out the size of the target pool where **challenge-based in-game promotions will be presented to them** by comparing the number of Medium and High Engagement players who already prefer the **Hardest Difficulty** setting. I used a **Grouped Bar Chart Showing Raw Counts and Percentages** because this format clearly establishes the volume of Medium players who are already pre-disposed to the Hardcore behavior of seeking challenge, allowing the product team to efficiently target event rewards toward them.



Interpretation

The **Medium Engagement segment** contributes the majority of the combined population currently engaging with the **Hardest Difficulty gameplay** setting. Specifically, 734 players who choose Hard difficulty are Medium Engagement (62.84% of the combined total), while 434 are High Engagement players (37.16%).

Key Insight

Challenge-based rewards have high relevance and volume. The largest pool of players already exhibiting the Hardcore trait of seeking challenge belongs to the target **Medium Engagement segment**. This pool of **734 players** represents a substantial, pre-qualified segment that is highly receptive to promotional events tied to difficulty completion.

Implications for Strategy

Action: Immediately launch **in-game, time-limited events** tied exclusively to the successful completion of Hard difficulty content. The rewards must be highly desirable and exclusive (eg. cosmetic upgrades, unique position titles) to fully capture the 734 challenge-ready Medium Engagement players and push them toward the Hardcore retention mindset.

Executive Summary: Shadow City Saga Conversion Strategy

Goal: Devise marketing and product strategies to convert **Casual Players** into **Hardcore Players** to maximise the lifetime value of *Shadow City Saga*.

This analysis defined the precise behavioral and progression thresholds separating Casual from Hardcore players, concluding that **0.51%** of the Medium Engagement segment is already exhibiting Hardcore gaming habits. The strategy focuses on hyper-targeting this high-potential pool **and the 734 players who are pre-disposed to seeking challenge** to ensure maximum return on marketing and product development efforts.

Key Analytical Findings (The Diagnosis)

- **Primary Conversion Drivers:** The only reliable behavioral differentiators are **Session Frequency** (median gap: 9 to 15 sessions/week) and **Session Duration** (median gap: 84 to 138 minutes). **Purchase History** and **Achievement Count** are poor predictors of future engagement.
- **Critical Thresholds:** The highest-risk stagnation point is the Level **51** → **52** transition, and the critical time-on-screen threshold is **138 minutes** of sustained session duration.
- **Target Pool Efficiency:** Targeting must be precise and efficient with the main financial conversion pool being only **0.51% (20 Players)** of the entire Medium Engagement segment, while a larger group of **734 players** from the Medium Engagement segment that chose the Hardest Difficulty gameplay can be motivated and retained through exclusive difficulty-based challenges.

Act

Three Core Strategic Recommendations

Strategy Focus	Actionable Specification	Estimated Impact
I. Digital Channel Targeting	Immediately flag the **0.51%** High-Potential Medium players and deliver high-value, exclusive offers (eg. 50% VIP Pass discount) to convert established **hardcore behavior** into revenue.	Focuses resources only on the highest ROI targets, minimising marketing expenditure on low-potential players.
II. In-Game Product Prompt	Programme the **highest-value promotional trigger** (eg. recurring subscription offer) to appear precisely at the **138-minute session mark**, before natural player churn.	Leverages the behavioral intensity threshold to capture revenue at the point of greatest commitment.
III. Retention & Motivation	Launch **exclusive, challenge-based events** tied to Hard Difficulty completion, targeting the **734 Medium players** who are already seeking challenge.	Rewards existing aspirational behavior, reinforcing the Hardcore mindset and driving long-term player retention via exclusive content.

Conclusion

This capstone analysis successfully addressed the core business challenge of converting Casual Players into Hardcore Players by moving beyond general engagement metrics to define precise, **actionable behavioral thresholds**.

The project established that the Hardcore player mindset is exclusively driven by **Session Frequency (15 sessions/week)** and **Session Duration (138 minutes/session)**. All other factors, including **Purchase History** and **Achievement Count**, were found to be inefficient drivers of long-term retention.

The analysis culminated in the identification of a hyper-efficient **High-Potential Target Pool** comprising only **0.51% of the Medium Engagement segment** and a substantial **734-player cohort** ready for challenge. This finding mandates a strategic shift from broad promotional campaigns to a surgical, high-ROI approach.

The resulting three strategic recommendations—including programming the highest-value promotion to trigger precisely at the **138-minute session mark**, hyper-targeting the Level **51 → 52** transition, and implementing **exclusive challenge-based events tied to Hard Difficulty**—provide Atlas Interactive with clear, measurable product specifications. By adopting this data-driven strategy, Atlas Interactive can immediately focus resources on the most motivated players, ensuring that the conversion of this high-potential pool yields a **maximum return on investment** and significantly boosts the long-term Lifetime Value of *Shadow City Saga*.